

AMENDMENT

*In the Claims:*

These claims replace all prior versions and listings of claims in the above-referenced application.

1           1. – 25. (Cancelled)

1           26. (New) A multiprocessor system, comprising:  
2           a plurality of processors that operate in parallel;  
3           a plurality of agents comprising agent data ports coupled to respective processors;  
4           a plurality of memory controllers coupled to each of the plurality of agents via the  
5           agent data ports;  
6           a plurality of memory units coupled to respective memory controllers; and  
7           at least one crossbar comprising crossbar data ports coupled to a plurality of  
8           agents via respective crossbar data ports and agent data ports.

1           27. (New) The system of claim 26, wherein the agents and the at least one  
2           crossbar comprise routing logic and return routing logic.

1           28. (New) The system of claim 27, wherein the routing logic decrements  
2           a current hop count.

1           29. (New) The system of claim 27, wherein the routing logic directs the  
2           transmission of a packet via a select port responsive to the current hop count.

1           30. (New) The system of claim 27, wherein the return routing logic  
2           records a return route in the data packet as the data packet traverses the route to its  
3           respective destination.

1           31. (New) The system of claim 27, wherein the return routing logic  
2           inserts an ingress port indicator into the data packet header, the indicator responsive to  
3           the port where the data packet was received.

1           32. (New)     The system of claim 27, wherein the agents further comprise a  
2     routing table.

1           33. (New)     The system of claim 32, wherein the routing table comprises at  
2     least one route from the source device to the destination device.

1           34. (New)     The system of claim 27, wherein the agents further comprise  
2     source logic.

1           35. (New)     The system of claim 34, wherein the source logic identifies a  
2     route communicated via a data packet header comprising an egress data port of a next  
3     subsequent device along the route, a current hop count, and a total number of hops in the  
4     route.

1           36. (New)     The system of claim 27, wherein the agents further comprise  
2     destination logic.

1           37. (New)     The system of claim 36, wherein the destination logic  
2     examines a data packet to determine if the packet has reached a designated destination.

1           38. (New)     The system of claim 36, wherein the destination logic swaps an  
2     ingress port indicator with an egress port indicator in a data packet header when the  
3     current hop count exceeds a threshold value.

1           39. (New)     The system of claim 27, wherein the agents further comprise  
2     return route reconstitution logic.

1           40. (New)     The system of claim 39, wherein the return route reconstitution  
2     logic identifies a source data port of a received data packet and writes the source port  
3     over a destination port.

1           41. (New)     The system of claim 39, wherein the return route reconstitution  
2     logic generates an acknowledgement packet.

1           42. (New)     The system of claim 41, wherein the acknowledgement packet  
2     reverses the order of destination ports along the route and resets a current hop count.

1           43. (New)     The system of claim 26, wherein the at least one crossbar  
2     routes a data packet from a first agent to a second agent pursuant to routing logic.

1           44. (New)     The system of claim 26, wherein the agents route a data packet  
2     from a first memory controller to a second memory controller pursuant to routing logic.

1           45. (New)     The system of claim 26, wherein the agents and the memory  
2     controllers comprise source logic, destination logic, return route reconstitution logic and  
3     a routing table.

1           46. (New)     The system of claim 45, wherein the routing table comprises at  
2     least one of a destination identifier, a crossbar identifier, destination ports, and a total  
3     hops value.

1           47. (New) A method for communicating data between devices in a  
2 parallel processing system, comprising:  
3                 providing a plurality of processors and memory units;  
4                 coupling an agent and a memory controller between each of the plurality of  
5 processors and memory units;  
6                 coupling at least one crossbar between each of the agents;  
7                 using source logic within the agents to generate a data packet to transmit data  
8 from a source device to a destination device via the at least one crossbar, wherein the  
9 source device comprises one of a memory unit and a processor and a destination device  
10 comprises one of a processor and a memory unit, respectively;  
11                 identifying a particular data route from the source device to the destination device  
12 through the at least one crossbar, the data route being communicated via a header  
13 associated with the data packet, the header comprising an egress port, a current hop  
14 count, and a total number of hops in the data route;  
15                 routing the data packet along the data route in response to the egress port; and  
16                 detecting the arrival of the data packet at the destination node.

1           48. (New) The method of claim 47, further comprising:  
2                 recording an ingress port indicator responsive to the port where the data packet  
3 was received along the data route.

1           49. (New) The method of claim 47, wherein identifying a particular data  
2 route from the source device to the destination device through the at least one crossbar  
3 comprises examining a routing table containing at least one of a destination identifier, a  
4 crossbar identifier, destination ports, and a total hops value.

1           50. (New) The method of claim 47, wherein routing the data packet along  
2 the data route comprises decrementing the current hop count.

1           51. (New) The method of claim 47, wherein routing the data packet along  
2 the data route comprises replacing an ingress port indicator with an egress port indicator  
3 the header when the current hop count falls below a threshold value.

1        52. (New)    The method of claim 47, further comprising:  
2                 acknowledging receipt of the data packet at the destination node by resetting the  
3                 current hop count to the total hop count and swapping an ingress port indicator with an  
4                 egress port indicator.

1        53. (New)    The method of claim 52, wherein acknowledging receipt is  
2                 accomplished independent of the state of a routing table in the destination device.

1        54. (New)    The method of claim 52, wherein acknowledging receipt  
2                 further comprises checking for a timeout.

1        55. (New)    The method of claim 54, further comprising:  
2                 using source logic within an agent to identify a next best data route for  
3                 transferring data from the source device to the destination device in response to the  
4                 timeout; and  
5                 generating a replacement data packet having an egress port indicator, a current  
6                 hop count, and a total hop count, the data packet responsive to the next best data route.

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